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Computer Dictionary

and

Handbook

THIRD EDITION

by

Charles J. Sippl

and

Roger J. Sippl

Howard W. Sams & Co., Inc.
4300 WEST 62ND ST. INDIANAPOLIS, INDIANA 46268 USA

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Sams & Co., Inc.
Indianapolis, Indiana 46268

THIRD EDITION
THIRD PRINTING—1981

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International Standard Book Number: 0-672-21632-9
Library of Congress Catalog Card Number: 79-67133

Printed in the United States of America.

which prints through the paper medium by allowing only the raised character to make contact with the printing ribbon.

emergency switch — Switch on most control panels which will disconnect all power from the computer system.

emitter — A device, usually used on punch-card machines, to give timed pulses at regular intervals during the machine cycle.

emitter, character — An electromechanical device used to generate and emit, in some code, pulse groups corresponding to characters.

emitter pulse — Relating to a punched card machine, one of the group of pulses that is used to define a particular row within the columns of a card.

empirical — Pertaining to a statement or formula based on experience or experimental evidence rather than on mathematical or theoretical conclusions.

empirical documentation — *See* documentation, empirical.

emulate — The ability of one system to imitate another, with the imitating system accepting the same data and programming and achieving the same results as the imitated system, but possibly with a different time of performance.

emulation — Techniques using software or microprogramming in which one computer is made to behave exactly like another computer; i.e., the emulating system executes programs in the native machine language code of the emulated system. Emulation is generally used to minimize the impact of conversion from one computer system to another, and is used to continue the use of production programs—as opposed to "simulation" which is used to study the operational characteristics of another (possibly theoretical) system.

emulation, remote terminal — Remote terminal emulation is a computer measurement and evaluation technique whereby the teleprocessing workload imposed on a computer system is emulated by another computer. This is a relatively recent development applicable to benchmarking and tuning.

emulation testing — The use of hardware or software to generate in real-time the expected correct output responses for comparison to the DUT (device under test).

emulator — Hardware built into a computer causing the system to accept certain software programs and routines and appear as if it were another system, such as 7094 software running on an IBM 360 computer without translation.

emulator, stand-alone — An emulator whose execution is not controlled by a control program; it does not share system resources with other programs and excludes all other jobs from the computing system while it is being executed.

enable — Restoration of a suppressed interrupt feature.

enabled — The condition of an interrupt level wherein the level is not inhibited from advancing from the waiting state to the active state, except for priority considerations.

enable pulse — A digit pulse which aids the write pulse, which together are strong enough to switch the magnetic cell.

enabling signal — A means of allowing an operation to take place.

encipher — *Same as* encode.

encode — 1. To apply a code, frequently one consisting of binary numbers, to represent individual characters or groups of characters in a message. (Synonymous with encipher.) 2. To substitute letters, numbers, or characters, usually to intentionally hide the meaning of the message except to certain individuals who know the enciphering scheme. (Synonymous with encipher.)

encoded question — A question set up and encoded in a form appropriate for operating, programming, or conditioning a searching device.

encoder — A device capable of translating from one method of expression to another method of expression, for instance in translating a message, "add the contents of A to the contents of B," into a series of binary digits. (Contrasted with decoder and clarified by matrix.)

encoder, exception-item — The exception-item encoder offers the final link in banking's total automation chain. Providing "point of entry" encoding before documents enter a bank's paper flow, the unit eliminates costly disruption caused by nonencoded items in a bank's automated system.

encoding strip — On bank checks, the area in which magnetic ink will be deposited to represent characters.

ICIP — Abbreviation for International Conference on Information Processing.

IC memory systems — Although a primary advantage of an IC system is its potential for decreased cost, it has other advantages as well. For example, an IC memory has all of its sensing, driving and decoding circuits built in, so it requires very little additional support electronics on its memory card other than circuits to handle a few control signals, byte controls, data and address buffers, sense amplifiers and chip enable drivers. A typical 16K × 18 IC memory system contains 72 4K memory chips, 10 timing and control devices, 6 data buffers, 6 address buffers, and 2 chip enable drivers. Miscellaneous capacitors and resistors raise the total component count in the system to approximately 130. (A core memory with the same capacity would contain over 600 components.)

iconographic model — A pictorial representation of a system and the functional relations within the system.

identification — A code number or code name that uniquely identifies a record, block, file or other unit of information.

identification, coded — 1. The process of providing personal, equipment, or organizational characteristics or codes to gain access to computer programs, processes, files, or data. 2. The process of determining personal, equipment, or organizational characteristics or codes to permit access to computer programs, processes, files, or data.

identification division — The part of COBOL programming in which the programmer gives information to identify the source program and the object program.

identification, file — The coding required to identify each physical unit of the outputs of electronic data-processing machine runs.

identifier — 1. A symbol whose purpose is to identify, as to indicate or name a body of data. 2. A key.

identifier, data use — A title or name for the use of the data items for a data element; for instance, an occurrence date such as the employment date of an employee that is used for data base information.

identifier, location — An identification, by label of some kind, assigned to a specific location, for instance, a city, neighborhood, or address, or a specific location in computer storage.

identifier word — A full-length computer word which is associated with a search or a search-read function. In a search or search-read function, the identifier word is stored in a special register in the channel synchronizer and compared with each word read by the peripheral unit (some systems).

identify — To attach a unique code or code name to a unit of information.

identifying — The procedure that identifies the source of a given information mark and, therefore, of an object or a location. The operation involves selection and translation.

identifying code — A code placed in perforated tape or punched cards to identify the contents, or their origin.

idle character — A control character that is sent when there is no information to be sent. Sometimes called a null character.

idle time — The time that a computer is available for use, but is not in operation.

IDP, Integrated Data Processing — 1. A system that treats as a whole all data-processing requirements to accomplish a sequence of data-processing steps or a number of related data-processing sequences, and that strives to reduce or eliminate duplicating data entry or processing steps. 2. The processing of data by such a system in which all procedures are tied to the computer.

IEEE 583/CAMAC — A hardware/software standard developed originally for the nuclear industry but currently widely adopted by other industrial users.

ier — Short for multiplier.

if-A then B gate — *Same as* gate, B OR-NOT A.

if-A then NOT-B gate — *Same as* gate, NAND.

if-B then NOT-A gate — *Same as* gate, NAND.

IFCS — Abbreviation for International Federation of Computer Sciences.

IFIPS — Abbreviation for International Federation of Information Processing Societies.

IF-THEN-ELSE — A program statement often used in high level languages. When the IF statement is true, THEN ment, initiation of analog sequences, etc.

sense light — A light that may be turned on or off and may be interrogated by the computer to cause a program branch.

sense, mark — To mark a position on a punched card by an electrically conductive pencil, for later conversion to machine punching.

sense switch — A switch on the console of a computer that may be set up or down. Statements may be included in a program to test the condition of these switches and to vary program execution based on these settings. Also called alteration switch.

sensible, machine — *See* data, machine readable.

sensing, automatic display flags — Control state or mode permits the visual display to jump, conditioned on the states of its own flags (light pen flag, edge flag, stop flag, etc.). This reduces the number of program interrupts.

sensing element — The specific portion of a device which is directly responsive to the value of the measured quantity.

sensing, mark — A technique for detecting special pencil marks entered in special places on a punch card, and automatically translating the marks into punched holes.

sensing signal — A specific signal which is often translated at the start of a message for the purpose of initiating circuit operation at the receiving end of a circuit.

sensitive-language, computer — *See* language, computer-sensitive.

sensitivity — The degree of response of an instrument or control unit to change in the incoming signal.

sensitivity analysis — A test or trial of a range or number of input values to determine the response, interdependence, or friction of the output values. Sensitivity analysis is often called parametric programming because, in such investigations, one or more parameters are permitted to vary in order to determine whether or not a solution should be modified.

sensor — A device that permits a computer to obtain analog information concerning temperatures, flows, pressure, and so forth.

sensor-based computer — A type of computer designed and programmed to receive real-time data (analog or digital) from transducers, sensors, and other data sources that monitor a physical process. The computer may also generate signals to elements that control the process. For example, the computer might receive data from a gauge or flowmeter, compare the data with a predetermined standard, and then produce a signal that operates a relay, valve, or other control mechanism.

sensor-based system — A type of organization of components including a computer whose primary source of input is data from sensors and whose output can be used to control the related physical process.

sensor, dielectric — A special sensor used in reading data from paper tape.

sensor/entry device, data collection — The sensor/entry device in the closed-loop system is matched to the input documents. It can be an optical reader, a tag reader, a magnetic-ink reader, or a mark reader. The sensor/entry device can also be a key-to-tape or key-to-disk station, or even a crt tied directly to the computer on line.

sentence — In COBOL, a sequence of one or more statements specifying one or more operations, according to certain rules, and terminated by a period.

sentinel — A symbol to mark a unit of information, e.g., the end of an item, field, block, tape, file, etc.

separating character — *See* character, separating.

separation symbol, item — A control symbol which indicates beginning of an item.

separator — A flag that separates and organizes items of data.

separator, word — A character in machine coding that segregates fields.

SEPOL — Acronym for Soil-Engineering Problem-Oriented Language.

septenary number — A number, usually of more than one figure, representing a sum, in which the quantity represented by each figure is based on a radix of seven. The figures used are: 0, 1, 2, 3, 4, 5, and 6.

sequence — 1. To put a set of symbols into an arbitrarily defined order. 2. An arbitrarily defined order of a set of symbols; i.e., an orderly progression of items of information or of operations in accordance with some rule.

sequence break (sorting) — That point in a file between the end of one string and start of another.

sequence, calling — A specified arrangement of instructions and data necessary to set up and call a given subroutine.

sequence check — A data-processing operation designed to check the sequence of the items in a file.

sequence checking — A sequence check is used to prove that a set of data is arranged in either ascending or descending order before it is processed. It is generally a mechanized operation performed in a separate machine run or simultaneously with another operation run.

sequence-checking routine — A routine that checks every instruction executed and prints out certain data; e.g., to print out the coded instructions with addresses, and the contents of each of several registers, or it may be designed to print out only selected data, such as transfer instructions and the quantity actually transferred.

sequence, collating — A sequence of characters as arranged in the order of their relative precedence. The collating sequence of a particular computer is determined as part of its design; each character acceptable to the computer has a preassigned place in this sequence. A collating sequence is used primarily in comparing operations.

sequence, control — The normal order of selection of instructions for execution. In some computers one of the addresses in each instruction specifies the control sequence. In most computers, the sequence is consecutive except where a transfer occurs.

sequence control register — *See* register, sequence control.

sequence control tape — A tape that contains the sequence of instructions required for solving a problem.

sequence counter — *Same as* register, sequence control.

sequence error — A condition in which a card is out of sequence within an object program.

sequence error checking — Protocols often include alternating acknowledgments and block sequencing. The technique used depends on the protocol. The receiving station sends back an indication of a sequence error with a negative acknowledgment or some other control message.

sequence monitor — Computer monitoring of the step-by-step actions that should be taken by the operator during a startup and/or shutdown of a power unit. As a minimum, the computer would check that certain milestones had been reached in the operation of the unit. The maximum coverage would have the computer check that each required step is performed, that the correct sequence is followed, and that every checked point falls within its prescribed limits. Should an incorrect action or result occur, the computer would record the fault and notify the operator.

sequence packing — A procedure for loading the upper half of an accumulator with the first data word, shifting this into the lower half, loading the second datum, shifting, etc., so that the three data words are thus packed in sequence.

sequence, pseudorandom number — A sequence of numbers, determined by some defined arithmetic process that is satisfactorily random for a given purpose, such as satisfying one or more of the standard statistical tests for randomness. Such a sequence may approximate any one of several statistical distributions, e.g., uniform distribution or a normal (Gaussian) distribution.

sequence, queue (any) — A collection of items in the system which are waiting for the attention of the processors. The any-sequence queue is organized so that items may be removed from the collection without regard to the sequence in which they entered it.

sequencer — 1. A machine which puts items of information into a particular order; e.g., it will determine whether A is greater than, equal to, or less than B and sort or order accordingly. 2. A circuit that pulls information from the control store memory (microprogram store), based upon external events or conditions.

sequence, random — A sequence that is not arranged by ascending or descending keys, as in alphameric or numeric sequences, but is instead arranged in an organized fashion in bulk storage by locations determined by calculations performed on keys to develop addresses.

The calculations are repeated in order to acquire the address and locate the item desired.

sequence, random-number — An unpredictable array of numbers produced by change, and satisfying one or more of the tests for randomness.

sequence register — A special register that, when activated, designates the address of the next instruction to be performed by the computer.

sequence timer — A succession of time-delay circuits arranged so that completion of the delay in one circuit initiates a delay in the following circuit.

sequencing — The act which puts into order various data as to rank, time, or other predetermined order classification.

sequencing, automatic — The ability of equipment to put information in order or in a connected series without human intervention.

sequencing by merging — A technique of repeated merging, splitting, and remerging can be and is often used to place items into an organized arrangement.

sequencing criteria (sorting) — The fields in a record which determine, or are used as a basis for determining, the sequence of records in a file.

sequencing key (sorting) — The field in a record which determines, or is used as a basis for determining, the sequence of records in a file.

sequencing, time — Switching signals generated by a program purely as a function of accurately measured elapsed time.

sequential access, data base — In some systems, files can be accessed sequentially. In sequential access mode, records are processed in consecutive order. Sequential access is best used for those files in which all or most of the records in the file are processed each time the file is opened. In various systems, relative files are accessed sequentially through the relative record number that represents the beginning of a given file. Some systems begin with a given relative record and successively return the next existing record until processing is completed. Indexed files permit the sequential access of records as well. In indexed processing, records are retrieved from files based on the values of data items, known as key fields, in the records. The collection of all existing values in a given key field is an index. Each record has at least one primary and zero or more alternate keys all of which point to the same record and each of which comprises an entry in an individual index.

sequential-access storage — A storage technique in which the stored items of information become available only in a one after the other sequence, whether or not all the information or only some of it is desired, e.g., magnetic-tape storage. (Related to serial storage, and contrasted with random-access storage.)

sequential alarm module — In some systems, the specific device which continuously monitors a group of alarm contacts; i.e., whenever one or more of these contacts close, the module immediately signals a priority interrupt to the computer. The computer then reads the module contact input states to thereby establish a trip sequence from current and previous readings.

sequential collating — Sequencing a group of records by comparing the key of one record with another record until equality, greater than, or less than, is determined.

sequential computer, logic-controlled — A specific sequential computer with the capability of executing instructions in a sequence designed by particular built-in logic, i.e., a fixed sequence, but one which can be overridden or changed by an instruction; a highly unique and almost single-purpose computer with little or no concurrent action.

sequential control — A mode of computer operation in which instructions are executed in consecutive order, unless otherwise specified by a jump.

sequential data set, indexed — *See* data set, indexed sequential.

sequential file — To get to an item in a sequential file, the user must first read all the preceding items (records, sectors, blocks, or bytes). In a random-access file, individual bytes can be directly addressed because information within the file is usually segmented or delimited by a number of bytes. A sequential file might use record separators or end-of-file marks as delimiters, with a correspondingly larger lower limit on the size of the smallest amount of information transferred. The same applies when a file is updated.